

ABSTRACT

The present invention is directed to off axis optical signal redirection architectures that employ positionable reflective microstructures (e.g. microelectromechanical (MEM) mirrors) fabricated on one or more substrates. In one embodiment, an optical signal redirection system (10) includes a reflective microstructure array (12) formed on a substrate (30). The reflective microstructure array (12) includes one or more reflective microstructures (14). Each of the reflective microstructures (14) includes an optically reflective surface (20) and is positionable with respect to the substrate (30) in order to orient its reflective surface (20) for redirecting optical signals (24) incoming from one or more originating locations (16) to one or more target locations (18). Each orientation required for a given reflective microstructure (14) to redirect an optical signal (24) incoming from an originating location (16) to a target location (18) is defined by a unit vector (22) that is normal to the reflective surface (20) of such reflective microstructure (14). An average normal vector (26) associated with the reflective microstructure array (12) defined as the average of the set of individual unit normal vectors (22) forms a first non-zero angle θ with respect to the substrate normal (34)